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(73) Proprietor: **WARNER-LAMBERT COMPANY**  
**201 Tabor Road**  
**Morris Plains New Jersey 07950 (US)**

(72) Inventor: **Barcelon, Shirley Ann**  
**44 Center Grove Road**  
**Randolph, New Jersey 07869-5805 (US)**  
Inventor: **Husseln, Mamoun M.**  
**115 Boulevard**  
**Mountain Lakes, New Jersey 07046 (US)**  
Inventor: **Mansukhani, Gul**  
**97 Petrus Avenue**  
**Staten Island, New York 10312 (US)**  
Inventor: **Cherukuri, Subraman Rao**  
**10 Jean Drive**  
**Towaco, New Jersey 07082 (US)**  
Inventor: **Faust, Steven Michael**  
**4-51 Audubon Court**  
**Stanhope, New Jersey 07874 (US)**

(74) Representative: **Mansmann, Ivo et al**  
**Gödecke AG**  
**Patentwesen**  
**Mooswaldallee 1-9**  
**D-79090 Freiburg (DE)**

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**EP 0 427 505 B1**

## Description

To reduce calories in chewing gum it is often necessary to replace the soluble sugar and/or sugar alcohol bulking agents with low calorie alternatives. The soluble sugar and sugar alcohol bulking agents not only impart necessary sweetness but also a discontinuity to the gum base which results in a softer more pleasant chew and mouth feel.

Flavor release from chewing gum is influenced by many factors, the most important of which are the type and amount of gum base and the type and amount of flavor. The composition of the flavor, if varied, may result in a change of flavor release characteristics. The gum base on the other hand, acts as a trap for the flavor. The stronger the affinity of the flavor components for the gum base, the slower will be the flavor release from the gum.

The problem of slow or delayed flavor release from chewing gum becomes acute when gum base content is high. The current trend and popularity of low or reduced calorie chewing gum products necessitates the use of high gum base levels. An increase of gum base levels requires an appreciable increase of flavor levels in the gum. This increase, however, does not solve the problem of slow flavor release and delayed initial flavor impact upon chewing. Moreover, an appreciable increase in the flavor ingredient may result in excessive softening of the gum giving a poor chew and texture. Good flavor impact and sustained flavor release are desirable attributes in any chewing gum, especially in reduced calorie, high base content chewing gums.

The present invention relates generally to an improved low calorie, high base content chewing gum composition with an increased flavor intensity, duration, and method for its preparation. More specifically, the present invention relates to the use of specially extracted or fractionated flavour oils which bring about an enhanced and sustained flavour release in chewing gum compositions with high gum base preparations. In particular, the present invention concerns the use of highly fractionated terpeneless and sesquiterpeneless mint oils in high gum base content gum compositions with results in superior flavour release attributes.

U.S. Patent No. 3,867,262 to Rockland et al. discloses a process for the preparation of terpeneless essential oils whereby the oil is distilled to remove non-volatile materials. The volatile components are adsorbed onto a solid alumina adsorbent which has been pre-treated with ethyl acetate that alters the relative affinity of the adsorbent for the terpenes and for the oxygenated components of the oil. The terpenes are separated from the desired constituents of the oil by elution of the adsorbent with a terpenophilic solvent.

EP-A-0 349 186, filed before but published after the date of application of the present application discloses improved flavor oils, such as spearmint and peppermint oils, prepared by extraction of common plant materials at a low temperature with high pressure using carbon dioxide as a solvent. The flavor oils prepared by the supercritical extraction process demonstrate enhanced organoleptic qualities, greater stability and shelf-life and prolonged flavoring agent properties.

According to one aspect of the present invention, there is provided a low calorie, high base content chewing gum composition with improved flavour intensity and duration, comprising:-

- (a) a gum base in an amount of from 50% to 90% by weight of the composition;
- (b) a flavour oil from which some or all of the terpene components originally present have been removed and which is present in an amount of from 0.3 to 3.0% by weight of the composition;
- (c) an intense sweetener in an amount of from 0.01% to 3.0% by weight of the composition; and
- (d) a bulking agent in an amount of from 10% to 40% by weight of the composition.

According to another aspect of the present invention, there is provided a process for producing a low calorie, high base chewing gum composition with improved flavour intensity and duration, the process comprising:-

- (a) admixing a melted soft PVA-based chewing gum base with a bulk sweetening agent until a uniform mixture is formed;
- (b) optionally admixing a filler and/or a colourant until a uniform mixture is formed;
- (c) admixing an artificial intense sweetener until a uniform mixture is formed;
- (d) slowly admixing a flavouring oil from which some or all of the terpene components originally present have been removed;
- (e) mixing until a homogeneous mass is formed; and
- (f) cooling the resulting mix to form a chewing gum and recovering the product.

The flavour oil is preferably a mint oil. Preferably the terpenes which are removed from the flavour oil are removed by extraction or fractionation.

Reference will be made later herein to the drawings, in which:-

Figure 1 is a graph depicting the flavour release rates of standard peppermint gum (A) with two gum compositions (B + C) made with fractionated and terpeneless peppermint oils of the present invention;

Figure 2 is a graph comparing the overall degree of liking as expressed by a test panel over time for the same three gum compositions comprised of standard peppermint oil (A) and fractionated mint oils (B + C) of the present invention;

Figure 3 is a graph comprising the change in flavour intensity over time that occurs in a gum with standard peppermint oil (A) and a specially fractionated peppermint oil with a lower menthonic fraction (D); and

Figure 4 is a graph comprising the overall degree of liking as expressed by a taste panel over time for a gum with standard peppermint oil (A) and one with a specially fractionated peppermint oil with a lower menthonic fraction (D).

Although any suitable flavour oils may be employed, mint oils are preferred, and much of the following description relates to mint oils, although many of the matters mentioned in relation to mint oils are applicable to other flavour oils. The mint oils that impart the flavour of interest can be fractionated or rectified by vacuum distillation or on a spinning band column. The fractionation removes the "heads" and "tails" of the oil components which are essentially monoterpenes and sesquiterpenes. The removal of these compounds from the oil reduces the affinity of the flavour oil for the gum base and, therefore, better up front flavour impact, greater sustained flavour release and improved taste are made possible.

The reduced calorie chewing gum compositions of the present invention can be prepared as a variety of gum products such as stick gum, slabs, chunk, balls, ropes, tablets and/or centre-filled gum products. In order to produce a reduced calorie or low calorie gum, it is advisable and necessary to increase the gum base to high levels thereby reducing the otherwise caloric components such as carbohydrates and bulk sweeteners.

Most reduced or light calorie chewing gum compositions generally contain about 25% by weight of a water-insoluble gum base, inert fillers or texturizing agents in amounts of at least 40% by weight up to 90% or more, a water-soluble flavouring agent and water-soluble sweeteners such as sucrose and corn syrup or, in sugarless gum, sorbitol, mannitol and artificial sweeteners. Also incorporated within the gum base may be plasticizers or softeners to improve consistency and texture of the gum.

The gum base of reduced or light calorie chewing gum generally contains a natural rubber gum base, a synthetic rubber gum base and/or mixtures thereof. When synthetic gum bases are utilized, the preferred elastomer component has been the styrene-butadiene copolymer (SBR). Gum base is noncaloric and insoluble. A chewing gum composition high in gum base content may also thus be reduced in calories.

Previous attempts to produce such high gum base content low calorie chewing gum compositions have resulted in products with a hard, tight, rubbery chew and poor texture.

The type and amount of gum base employed will vary greatly depending on various factors such as the intended bulk sweetener content of the final product, the type of base used and other components used to make the final product. The chewing gum compositions of the present invention preferably contain a soft polyvinyl acetate (PVA) gum base. In general, gum base amounts of 50% to 90% by weight of the final chewing gum composition are acceptable for use in the chewing gum compositions of the present invention with preferred amounts being from 55% to 85% and more preferred amounts being from 60% to 70% by weight.

Soft PVA gum bases are defined as providing a hydrophilic chew character to the chewing gum, which, when formulated into a chewing gum, results in a composition that absorbs moisture to swell and soften in the mouth. This results in a pleasant, moist chew.

Preferably, the gum base used in this invention may be any water insoluble gum base having polyvinyl acetate as an ingredient together with a natural or synthetic elastomer or mixtures thereof. Such gum bases are known in the art and an example of such a soft PVA-containing gum base is found in U.S. Patent No. 4,490,395 which is hereby incorporated by reference. Illustrative examples of natural elastomers in gum bases include, without limitation, substances of vegetable origin such as chicle, jelutong, gutta percha and crown gum. Examples of synthetic elastomers include, without limitation, isobutylene-isoprene copolymers, styrene-butadiene copolymers, polyethylene, polyisobutylene and mixtures thereof.

The elastomer content employed is in an amount of from 0.5 to 20%, and preferably 2.5% to 15% by weight of the gum base. When the total amount of elastomer is below 0.5% the base composition lacks elasticity, chewing texture, and cohesiveness whereas at amounts above about 20% the formulation is hard and rubbery and maintains a tight chew.

The gum base composition contains elastomer solvents to aid in softening the polymer components. Such elastomer solvents comprise methyl, glyceryl or pentaerythritol esters of rosins or modified rosins, such as hydrogenated, dimerized or polymerized rosins or mixtures thereof. Examples of elastomer

solvents suitable for use herein include the pentaerythritol ester of partially hydrogenated wood rosin, pentaerythritol ester of wood rosin, glyceryl ester of partially dimerized rosin, glyceryl ester of polymerized rosin, glyceryl ester of tall oil rosin, glyceryl ester of wood rosin, and partially hydrogenated wood rosin and partially hydrogenated methyl ester of wood rosin; terpene resins including polyterpene and polymers of  
 5 alpha-pinene or beta-pinene and mixtures thereof. The elastomer solvents may be employed in amounts ranging from 2% to about 55% and preferably from 4% to 18% by weight of the gum base. Amounts below about 2% cause the chew characteristic to be hard and result in inconsistent flavor release. Amounts above 55% cause a soft product to form which destroys the chew characteristic.

Vinyl polymers, and in particular polyvinyl acetate (PVA) serve as excellent gum bases. The preferred  
 10 PVA has a molecular weight of at least 2,000. Such materials are commercially available in various molecular weights which can be successfully used. Preferably, any PVA utilized in the present invention will have a medium molecular weight of 35,000 to 55,000 and blends of low and medium molecular weight PVA's are acceptable. The polyvinyl acetate is employed in amounts of 5% to about 45% by weight and preferably 7% to 35% by weight. These materials when used in such high amounts aid in extending the  
 15 elastomer mixture while maintaining product integrity and also provide a hydrophilic soft chew. Amounts below about 5% cause the base to be unstable. Amounts above 45% cause segregation of gum constituents to occur.

Glyceryl monostearate may be used as a suitable emulsifier. When absent, the formulation usually has a poorer stability and lacks acceptable texture. It is believed that the glyceryl monostearate aids in bringing  
 20 the normally immiscible constituents together in such a way that they form a single finely dispersed stable system. This emulsifier also simplifies the incorporation of flavors into the final base and aids in retaining finely divided solvents within the gum base complex. The glyceryl monostearate is employed in amounts of 1% to 15% and preferably 3% to 9%. Additional emulsifiers may also be included, notably lecithin, fatty acid and monoglycerides, diglycerides and triglycerides, propylene glycol monostearate and mixtures  
 25 thereof. Such materials may be used in the amount of 1% to 25% by weight.

The gum base formulation generally also employs wax material. The waxes have been found to soften the polymer elastomer mixture and improve elasticity of the chew character. The waxes employed are preferably microcrystalline wax, paraffin wax and combinations thereof. Useful amounts are from 2% to 25% by weight and preferably from 2.5% to 20% by weight of the gum base composition. Preferably these  
 30 waxes are used in combination in amounts of 5% to 20% microcrystalline wax and 3% to 15% paraffin wax.

A variety of additional ingredients such as plasticizers or softeners may optionally be added. These materials are optional and not essential in the present formulation. Such materials include hydrogenated vegetable oils, lanolin, stearic acid, sodium stearate, potassium stearate, glyceryl triacetate, acetylated monoglycerides, glycerin and the like and mixtures thereof. Such materials when incorporated into the gum  
 35 base obtain a variety of desirable texture and consistency properties. These individual materials are generally employed in amounts of up to 30%, preferably 1% to 25% by weight and most preferably in amounts of from 1.5% to 12% by weight of the gum base composition. Because of the low molecular weight of these compounds, they are able to penetrate the fundamental structure of the base making it plastic and less viscous.

The bulk sweetening agent may be selected from a wide range of water-soluble agents. Without being limited to particular sweeteners, representative illustrations encompass monosaccharides, disaccharides, and polysaccharides such as xylose, ribose, glucose, mannose, galactose, fructose, dextrose, polydextrose, cellulose, sucrose, maltose, partially hydrolyzed starch or corn syrup solids, palatinin and sugar alcohols  
 40 such as sorbitol, xylitol, mannitol, maltitol and mixtures thereof.

In general, the amount of bulk sweetener may vary with the desired amount of sweetness selected for a particular chewing gum composition and should be a quantity adequate to provide sufficient discontinuity to the gum base. This amount will normally be less than about 50% by weight when using an easily extractable sweetener. The water-soluble bulk sweeteners described above are preferably used in amounts of at least 5% to 35% by weight, and most preferably from 10% to 25% by weight of the final chewing gum  
 45 composition. The artificial intense sweetener may be selected from water-soluble artificial sweeteners and dipeptide-based sweeteners, including mixtures thereof. Without being limited to particular sweeteners, representative illustrations encompass the soluble saccharine salts, i.e., sodium or calcium saccharine salts, the free acid form of saccharin, cyclamate salts, acesulfame-K and the like, dipeptide sweeteners such as L-aspartyl-L-phenylalanine methyl ester and materials described in U.S. Patent No. 3,192,131 and the like,  
 50 and chlorosucrose compounds.

The intense sweetener is added in an amount greater than 0.01% by weight in order to provide longer lasting sweetness to the chewing gum composition. Amounts of up to 5.0% by weight are acceptable, and amounts up to 2.5% by weight are preferred. Amounts up to 1.00% by weight are most preferred, and most

preferably between 0.10% to 0.60% by weight of intense sweetener will be used. This quantity of intense sweetener in combination with less than 50% bulk sweetener unexpectedly provides a chewing gum composition having longer lasting sweetness. The sweetener is administered in either the free form, the encapsulated form or in mixtures thereof to provide a consistent delivery of longer lasting sweetness.

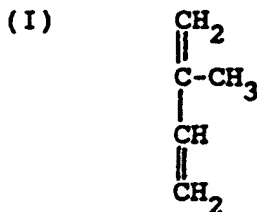
5 Encapsulated delivery systems for the sweetening agents comprise a hydrophobic matrix of fat or wax surrounding a sweetener or flavoring component. The fats may be selected from any number of conventional materials such as fatty acids, glycerides, polyglycerol esters, sorbitol esters, and mixtures thereof. Examples of fatty acids include hydrogenated and partially hydrogenated vegetable oils such as palm oil, palm kernel oil, peanut oil, rapeseed oil, rice bran oil, soybean oil, cottonseed oil, sunflower oil, safflower oil and mixtures thereof. Other fatty acid oils are contemplated. Glycerides which are useful include mono-, di-  
10 and triglycerides.

Useful waxes are chosen from among the group consisting of natural or synthetic waxes and mixtures thereof. Non-limiting examples include paraffin wax, petrolatum, carbowax, microcrystalline wax, beeswax, carnuba wax, candellila wax, lanolin, bayberry wax, sugarcane, spermaceti wax, rice bran wax and combinations thereof.  
15

The fats and waxes may be used individually or in combination in amounts varying from 10 to 70% by weight of the delivery system, and preferably in amounts of 40 to 58% by weight. When used in a combination, the fat and wax are preferably present in a ration of about 70:10 to about 85:15 of fat to wax.

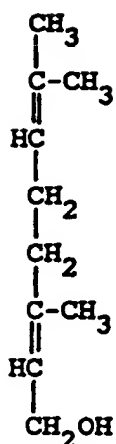
Typical encapsulated flavor or sweetener delivery systems are disclosed in U.S. Patent No. 4,597,970 and U.S. Patent No. 4,722,845 which are hereby incorporated by reference. The chewing gum composition of this invention may additionally include the conventional additives or coloring agents such as titanium dioxide; emulsifiers such as lecithin and glycerol monostearate; and fillers such as dicalcium phosphate, aluminum hydroxide, alumina, aluminum silicates, talc, calcium carbonate and combinations thereof. The total amount of fillers present is generally up to about 10% by weight. The colorants useful in the present  
25 invention include the pigments that may be incorporated in amounts of up to about 6% by weight and preferably up to about 1% by weight. A preferred pigment is titanium dioxide, also the colorants may include other dyes suitable for food, drug and cosmetic applications, and known as the FD&C dyes and the like. The materials acceptable for the foregoing spectrum of use are preferably water soluble. Illustrative examples include the indigo dye, known as FD&C Blue No. 2, which is the disodium salt of the 5,5-indigotindisulfonic acid. Similarly, the dye known as FD&C Green No. 1, comprises a triphenylmethane dye and is the monosodium salt of 4-[4-N-ethyl-p-(sulfobenzylamino)diphenylmethylene]-[1-(N-ethyl-p-sulfonium-benzyl)-2,5-cyclohexadienimine]. A full recitation of all FD&C and D&C colorants and their corresponding chemical structures may be found in the Kirk-Othmer Encyclopedia of Chemical Technology, Third Edition, in Volume 6 at pages 561-595, which text is accordingly incorporated herein by reference.

35 The flavor oil that is incorporated into the high gum base composition has been fractionated or rectified using standard distillation equipment to remove the terpene components that possess the high affinity for the gum base and cause the flavors to be trapped therein. This is carried out through standard distillation procedures using a vacuum distillation apparatus or a spinning band column. Terpenes themselves are simple, non-saponifiable lipids which are multiples of the isoprene molecule ( $C_5H_8$ ) whose molecular  
40 formula (I) is set forth below.

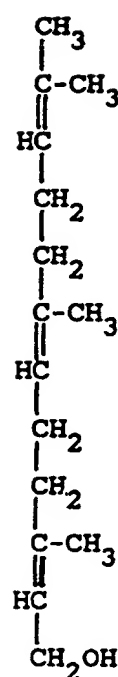


Monoterpenes (II) are basically comprised of two of the above isoprene units whereas sesquiterpenes (III) are comprised of three of these units.

(II)



(III)



Standard deterpenation, which results in removal of most of the "head" (monoterpene) fraction from the essential oil is also beneficial in providing enhanced flavor release. The benefit, however is less than when the fractionation of the oil is from the "head" as well as the "tail" fractions.

An additional type of fractionation of peppermint oil was done by extensive distillation or rectification whereby more of the head and tail as well as specific middle fractions were removed. It is evident that repeated distillations in this manner removed not only the mono- and sesquiterpenes but the menthonic fraction as well in a number of the mint flavor oils.

The major constituents of the "menthonic" fraction are menthone, its isomer iso-menthone, and menthofuran. Menthone has been traditionally understood to be an essential component of peppermint oil. Reducing the oil to more than 50% of the menthone and iso-menthone content as well as removal of the major portion of menthofuran has resulted in an improved quality oil. The improved oil possessed a clean mentholic sensation without the heavy herbal and resinous character. The oil had a reduced bitter taste and it would appear that the removed menthonic fraction and the tail fraction seem to contribute to the unpleasant bitter taste of peppermint.

Flavoring oils of particular utility in the practice of the present invention are those of the mint variety such as peppermint, spearmint and corn mint (*mentha arvensis*). The amount of deterpenated flavor oil employed is normally a matter of preference but it has been found that amounts ranging from 0.3 to 3.0% by weight of the final chewing gum composition are usable. The mint oils of the present invention can be utilized as the sole flavorant or can be combined with other standard single distillation mint oils.

A method for forming the chewing gum of the invention includes melting the gum base and mixing the gum base in a kettle with a portion of the bulk sweetening agent until a uniform mixture is formed. The balance of the sweetening agent, flavor, artificial intense sweetener and other conventional ingredients, if any, are added next with continued mixing until a homogeneous mass is formed. The product is recovered from the kettle and shaped to form stick, slab, chunk, ball, rope, shredded, tablet and/or center-filled gum products.

An illustrative process involves first melting the gum base at a temperature from about 70°C to about 120°C and mixing the gum base in the kettle with 2/3 or 3/4 of the sweetening ingredients for 2-8 minutes. To this mixture, optional fillers or colorants are added and mixing is continued for 1-4 minutes. The remaining sweetening ingredients are added and while mixing is continued, the flavoring agent is added slowly. The mixing is continued until a homogeneous mass is formed. The gum is discharged from the kettle and formed into its desired shapes such as sticks, slabs, chunks, balls, ropes, shredded, tablets and/or center-filled.

The following examples serve to provide further appreciation of the invention but are not meant in any way to restrict the effective scope of the claims. All percentages throughout the specification are by weight % of the final composition unless otherwise indicated.

5 Example 1:

Three peppermint flavored high-base chewing gums were prepared according to standard gum making procedures disclosed herein and known in the art in the following formulations:

|    |                                    |        |       |       |
|----|------------------------------------|--------|-------|-------|
| 10 | Ingredient                         | A      | B     | C     |
|    | Gum base                           | 65.00% | 65.0% | 65.0% |
|    | Polyols                            | 26.23  | 26.23 | 26.23 |
|    | Softeners                          | 5.20   | 5.20  | 5.20  |
| 15 | Aspartame                          | 0.35   | 0.35  | 0.35  |
|    | Encapsulated Aspartame             | 0.92   | 0.92  | 0.92  |
|    | Peppermint oil:                    |        |       |       |
|    | Low rectification, standard oil    | 1.90   | -     | -     |
| 20 | High rectification                 | -      | 1.90  | -     |
|    | High rectification & deterpination | -      | -     | 1.90  |
|    | Spray-dried peppermint flavor      | 0.40   | 0.40  | 0.40  |

25 The gum samples were chewed for 15 minutes and were rated by experienced and expert testers for flavor intensity and flavor, liking at 1, 5, and 15 minutes of the chewing period. The intensity and flavor liking ratings of the gums on chewing are shown in Figures 1-4.

As shown in Figure 1, sample C which contains highly fractionated and deterpenated peppermint oil resulted in higher intensity flavor, i.e. higher flavor release throughout the chewing period. A sustained flavor release was attained even after 30 minutes chew. Sample B, which contained highly rectified oil but was not fully deterpenated, had higher flavor release than the control sample, (A). Both samples B and C were also rated higher in liking than the control in the later stage of the chew period (Figure 2). The inventive highly fractionated oils resulted in very pleasant and less bitter tasting gums than the unfractionated oil.

35 The peppermint oil in sample C was specially fractionated to remove the monoterpenes fraction, "heads" and the major portion of the "tail" fraction, which contains the sesquiterpene compounds and their derivatives. Sample B, on the other hand, contained a moderately fractionated oil with approximately 50% removal of the monoterpene and tail sesquiterpene fraction. Sample A was redistilled to conform with USP specification, whereby only a small fraction of the oil was removed.

40 Example 2:

A high base chewing gum was prepared with a lower-menthone fraction oil as follows:

|    |  |        |
|----|--|--------|
| 45 | Ingredient   | D      |
|    | Gum base   | 65.00% |
|    | Polyol   | 26.23  |
|    | Softeners  | 5.20   |
|    | Aspartame  | 0.35   |
| 50 | Encapsulated Aspartame   | 0.92   |
|    | Highly rectified & deterpinated peppermint oil with low menthonic fraction | 1.90   |
|    | Spray-dried peppermint flavor  | 0.40   |

55 As shown in Figures 3 and 4, the gum made with the lower menthone peppermint oil was rated superior by the expert taste panel and was considered better tasting, less bitter, cleaner and possessed more mentholic flavor, having higher and more sustained flavor release than the control gum, A.

Figure 1 shows that the highly rectified and deterpenated oil is more liked and has higher flavor intensity on chewing. The flavor intensity is more sustained, i.e. the drop in intensity from initial impact to

the latter chew is less, in the gums with higher rectification and more deterpenated oils (B, C). Figures 2 and 3 show lower intensity and lower liking ratings for the standard rectified oil (A) than for the highly fractionated and lower menthone oil (D).

Gas chromatographic analyses were performed on oils used in the preceding examples. The results are in Table 1. The data show the fractions of peppermint oil which were affected. The oils B, C, and D of the present invention are considerably lower in the "head fraction," which includes the non-oxygenated monoterpenes (limonene, alpha-pinene, beta-pinene, sabinene, terpinolene), cineole, and 3-octanol. They are also lower in the "tail fraction," which includes pulegone, germacrene and other sesquiterpenes.

Table 1

| Comparative gas chromatographic analyses of the peppermint oils.       |       |       |       |       |       |
|--|-------|-------|-------|-------|-------|
| Component  | A (%) | B (%) | C (%) | D (%) | E (%) |
| Isobutyraldehyde   | 0.04  | 0     | 0     | 0     | 0     |
| Isovaleraldehyde   | 0.19  | 0     | 0     | 0     | 0     |
| A-Pinene   | 0.73  | 0     | 0.10  | 0     | 0     |
| B-Pinene   | 0.95  | 0     | 0.25  | 0     | 0.02  |
| Sabinene   | 0.45  | 0     | 0.12  | 0     | 0.01  |
| Myrcene  | 0.20  | 0     | 0.07  | 0     | 0.02  |
| A-Terpinene  | 0.34  | 0     | 0     | 0     | 0.07  |
| L-Limonene   | 1.49  | 0.11  | 0.68  | 0     | 0.30  |
| 1,8-Cineole  | 4.64  | 0.37  | 2.89  | 0     | 1.81  |
| Cis-Ocimene  | 0.30  | 0.08  | 0.17  | 0     | 0.09  |
| G-Terpinene  | 0.68  | 0.20  | 0.54  | 0     | 0.31  |
| P-Cymene   | 0.18  | 0     | 0.15  | 0     | 0.05  |
| Terpinolene  | 0.15  | 0.14  | 0.11  | 0     | 0.14  |
| 3-Octanol  | 0.24  | 0.14  |       |       |       |
| 1-Octen-3-ol   | 9.17  | 0.11  | 0.17  | 0     | 0.09  |
| trans-Sabinene Hydrate   | 1.04  | 1.04  | 0.12  | 0.18  | 0.98  |
| L-Menthone   | 19.33 | 23.13 | 22.28 | 10.84 | 23.80 |
| Menthofuran  | 1.84  | 2.02  | 1.95  | 0.50  | 2.30  |
| Iso-menthone   | 2.63  | 3.30  | 3.11  | 2.04  | 3.16  |
| B-Bourbonene   | 0.45  | 0.35  | 0.43  | 0.61  | 0.42  |
| Linalool   | 0.22  | 0.23  | 0.18  | 0.32  | 0.33  |
| Menthyl Acetate  | 5.14  | 5.15  | 4.59  | 7.54  | 4.42  |
| Neo-menthol  | 4.04  | 5.04  | 5.75  | 6.48  | 5.31  |
| B-Caryophyllene  | 1.62  | 0.89  | 1.37  | 2.07  | 0.60  |
| Terpinen-4-ol  | 1.13  | 1.43  | 1.62  | 1.05  | 1.17  |
| L-Menthol  | 41.11 | 51.35 | 46.87 | 63.57 | 46.77 |
| Pulegone   | 1.25  | 1.09  | 1.48  | 1.63  | 1.36  |
| Germacrene-D   | 2.12  | 0.37  | 1.92  | 0.70  | 1.89  |
| Piperitone +   | 0.99  | 0.64  | 0.62  | 0.92  | 0.58  |
| Viridiflorol   | 0.37  | 0.18  | 0.10  | 0     | 0.18  |
| A : Standard peppermint oil  |       |       |       |       |       |
| B : Highly fractionated and terpeneless oil                            |       |       |       |       |       |
| C : Moderate fractionation   |       |       |       |       |       |
| D : Special fractionation & lower menthone fraction                    |       |       |       |       |       |
| E : Terpeneless oil, standard deterpenation, "head" fraction cut only. |       |       |       |       |       |

The lower menthone oil, as shown in Table 1, not only has very low "head" and "tail" fractions, but also was tailored to reduce the amount of other components which are not disturbed in traditional distillations and processing of peppermint oil, e.g. 3-octanol, 1-octen-3-ol, menthofuran, and iso-menthone. The monoterpenes in this oil were completely removed, while in the highly fractionated oil (B) traces of them remained.



**Claims**

**Claims for the following Contracting States : BE, DK, FR, DE, GR, IT, NL, SE, CH, GB**

1. A low calorie, high base content chewing gum composition with improved flavour intensity and duration, comprising:-
  - (a) a gum base in an amount of from 50% to 90% by weight of the composition;
  - (b) a flavour oil from which some or all of the terpene components originally present have been removed, and which is present in an amount of from 0.3 to 3.0% by weight of the composition;
  - (c) an intense sweetener in an amount of from 0.01% to 3.0% by weight of the composition; and
  - (d) a bulking agent in an amount of from 10% to 40% by weight of the composition.
2. A composition according to claim 1, wherein the gum base comprises polyvinyl acetate (PVA) and a natural or synthetic elastomer selected from chicle, jelutong, gutta percha, crown gum, isobutylene-isoprene copolymer, styrene-butadiene copolymer, polyethylene, polyisobutylene and mixtures thereof.
3. A composition according to claim 1 or 2, wherein the gum base is present in an amount of from 50% to 70% by weight of the composition.
4. A composition according to claim 1, 2 or 3, wherein the flavour oil is a mint oil.
5. A composition according to claim 4, wherein the terpenes have been removed from the mint oil by extraction or fractionation.
6. A composition according to claim 5, wherein the terpenes which have been removed are monoterpenes and/or sesquiterpenes.
7. A composition according to claim 4, 5 or 6, wherein the mint oil is selected from peppermint, spearmint, corn mint and mixtures thereof.
8. A composition according to any preceding claim, wherein the flavour oil is present in an amount of from 0.1% to 4.0% by weight of the composition.
9. A composition according to any preceding claim, wherein the bulking agent is selected from xylose, ribose, glucose, mannose, galactose, fructose, dextrose, polydextrose, cellulose, sucrose, maltose, partially hydrolyzed starch or corn syrup solids, palatinit, sorbitol, xylitol, mannitol, maltitol and mixtures thereof.
10. A composition according to any preceding claim, wherein the bulking agent is present in an amount of from 10% to 25% by weight of the composition.
11. A composition according to any preceding claim, wherein the intense sweetener is selected from sodium or calcium saccharin salts, the free-acid form of saccharin, cyclamate salts, chlorosucrose derivatives, dipeptide compounds, acesulfame-K and mixtures thereof.
12. A composition according to claim 11, wherein the dipeptide compound is L-aspartyl-L-phenylalanine methyl ester.
13. A composition according to any preceding claim, wherein the intense sweetener is present in an amount of from 0.01% to 0.60% by weight of the composition.
14. A process for producing a low calorie, high base chewing gum composition according to claim 1 with improved flavour intensity and duration, the process comprising:-
  - (a) admixing a melted soft PVA-based chewing gum base with a bulk sweetening agent until a uniform mixture is formed;
  - (b) optionally admixing a filler and/or a colourant until a uniform mixture is formed;
  - (c) admixing an artificial intense sweetener until a uniform mixture is formed;
  - (d) slowly admixing a flavouring oil from which some or all of the terpene components originally present have been removed;

- (e) mixing until a homogeneous mass is formed; and
- (f) cooling the resulting mix to form a chewing gum and recovering the product.

15. A process according to claim 14, wherein the soft PVA chewing gum base is present in an amount of from 50% to 90% by weight of the chewing gum composition and the artificial intense sweetener is present in an amount of from 0.01% to 3.00% by weight of the composition.

16. A process according to claim 14 or 15, conducted to produce a chewing gum composition according to any one of claims 2 to 13.

#### Claims for the following Contracting State : ES

1. A process for producing low calorie, high base content chewing gum composition with improved flavour intensity and duration, which process comprises blending:-

- (a) a gum base in an amount of from 50% to 90% by weight of the composition;
- (b) a flavour oil from which some or all of the terpene components originally present have been removed, and which is present in an amount of from 0.3 to 3.0% by weight of the composition;
- (c) an intense sweetener in an amount of from 0.01% to 3.0% by weight of the composition; and
- (d) a bulking agent in an amount of from 10% to 40% by weight of the composition.

2. A process according to claim 1, wherein the gum base comprises polyvinyl acetate (PVA) and a natural or synthetic elastomer selected from chicle, jelutong, gutta percha, crown gum, isobutylene-isoprene copolymer, styrene-butadiene copolymer, polyethylene, polyisobutylene and mixtures thereof.

3. A process according to claim 1 or 2, wherein the gum base is present in an amount of from 50% to 70% by weight of the composition.

4. A process according to claim 1, 2 or 3, wherein the flavour oil is a mint oil.

5. A process according to claim 4, wherein the terpenes have been removed from the mint oil by extraction or fractionation.

6. A process according to claim 5, wherein the terpenes which have been removed are monoterpenes and/or sesquiterpenes.

7. A process according to claim 4, 5 or 6, wherein the mint oil is selected from peppermint, spearmint, corn mint and mixtures thereof.

8. A process according to any preceding claim, wherein the flavour oil is present in an amount of from 0.1% to 4.0% by weight of the composition.

9. A process according to any preceding claim, wherein the bulking agent is selected from xylose, ribose, glucose, mannose, galactose, fructose, dextrose, polydextrose, cellulose, sucrose, maltose, partially hydrolyzed starch or corn syrup solids, palatinit, sorbitol, xylitol, mannitol, maltitol and mixtures thereof.

10. A process according to any preceding claim, wherein the bulking agent is present in an amount of from 10% to 25% by weight of the composition.

11. A process according to any preceding claim, wherein the intense sweetener is selected from sodium or calcium saccharin salts, the free-acid form of saccharin, cyclamate salts, chlorosucrose derivatives, dipeptide compounds, acesulfame-K and mixtures thereof.

12. A process according to claim 11, wherein the dipeptide compound is L-aspartyl-L-phenylalanine methyl ester.

13. A process according to any preceding claim, wherein the intense sweetener is present in an amount of from 0.01% to 0.60% by weight of the composition.

14. A process according to any preceding claim, for producing a low calorie, high base chewing gum composition with improved flavour intensity and duration, the process comprising:-

- (a) admixing a melted soft PVA-based chewing gum base with a bulk sweetening agent until a uniform mixture is formed;
- 5 (b) optionally admixing a filler and/or a colourant until a uniform mixture is formed;
- (c) admixing an artificial intense sweetener until a uniform mixture is formed;
- (d) slowly admixing a flavouring oil from which some or all of the terpene components originally present have been removed;
- (e) mixing until a homogeneous mass is formed; and
- 10 (f) cooling the resulting mix to form a chewing gum and recovering the product.

15. A process according to claim 14, wherein the soft PVA chewing gum base is present in an amount of from 50% to 90% by weight of the chewing gum composition and the artificial intense sweetener is present in an amount of from 0.01% to 3.00% by weight of the composition.

#### Patentansprüche

Patentansprüche für folgende Vertragsstaaten : BE, DK, FR, DE, GR, IT, NL, SE, CH, GB

1. Kalorienarme und einen hohen Grundlagegehalt aufweisende Kaugummimasse mit verbesserter Aromaintensität und anhaltenderem Aroma, umfassend:
  - (a) eine Gummigrundlage in einer Menge von 50 bis 90 Gew.-% der Masse;
  - (b) ein Aromaöl, aus welchem einige oder sämtliche der ursprünglich vorhandenen Terpenkomponenten entfernt wurden, in einer Menge von 0,3 bis 3,0 Gew.-% der Masse;
  - (c) ein intensives Süßungsmittel in einer Menge von 0,01 bis 3,0 Gew.-% der Masse und
  - 25 (d) ein Masse lieferndes Mittel in einer Menge von 10 bis 40 Gew.-% der Masse.
2. Masse nach Anspruch 1, wobei die Gummigrundlage Polyvinylacetat (PVA) und ein natürliches oder synthetisches Elastomer, ausgewählt aus Chicle, Jelutong, Gutta percha, Kronengummi, Isobutyl-20 len/Isopren-Copolymer, Styrol/Butadien-Copolymer, Polyethylen, Polyisobutylen und Mischungen derselben, umfaßt.
3. Masse nach Anspruch 1 oder 2, wobei die Gummigrundlage in einer Menge von 50 bis 70 Gew.-% der Masse vorhanden ist.
- 35 4. Masse nach Anspruch 1, 2 oder 3, wobei das Aromaöl aus einem Minzeöl besteht.
5. Masse nach Anspruch 4, wobei die Terpene aus dem Minzeöl durch Extraktion oder Fraktionieren entfernt wurden.
- 40 6. Masse nach Anspruch 5, wobei die Terpene, die entfernt wurden, aus Monoterpenen und/oder Sesquiterpenen bestehen.
7. Masse nach Anspruch 4, 5 oder 6, wobei das Minzeöl aus Pfefferminze, grüner Minze, Ackermintze und Mischungen hiervon ausgewählt ist.
- 45 8. Masse nach einem der vorhergehenden Ansprüche, wobei das Aromaöl in einer Menge von 0,1 bis 4,0 Gew.-% der Masse vorhanden ist.
9. Masse nach einem der vorhergehenden Ansprüche, wobei das Masse liefernde Mittel aus Xylose, Ribose, Glucose, Mannose, Galactose, Fructose, Dextrose, Polydextrose, Cellulose, Saccharose, Malto-50 se, teilweise hydrolysierte Stärke oder Maissirupfeststoffen, Palatinit, Sorbit, Xylit, Mannit, Maltit und Mischungen derselben ausgewählt ist.
10. Masse nach einem der vorhergehenden Ansprüche, wobei das Masse liefernde Mittel in einer Menge von 10 bis 25 Gew.-% der Masse vorhanden ist.
- 55 11. Masse nach einem der vorhergehenden Ansprüche, wobei das intensive Süßungsmittel aus Natrium- oder Calciumsaccharinsalzen, Saccharin in freier Säureform, Cyclamatsalzen, Chlorsaccharosesalzen,

Dipeptidverbindungen, Acesulfam-K und Mischungen derselben ausgewählt ist.

12. Masse nach Anspruch 11, wobei die Dipeptidverbindung aus L-Aspartyl-L-phenylalaninmethylester besteht.

13. Masse nach einem der vorhergehenden Ansprüche, wobei das intensive Süßungsmittel in einer Menge von 0,01 bis 0,60 Gew.-% der Masse vorhanden ist.

14. Verfahren zur Herstellung einer kalorienarmen und einen hohen Grundlagengehalt aufweisenden Kaugummizumasse nach Anspruch 1 mit verbesserter Aromaintensität und anhaltenderem Aroma, durch:

(a) Vermischen einer aufgeschmolzenen weichen Kaugummigrundlage auf PVA-Basis mit einem Masse liefernden Mittel bis zur Bildung einer gleichmäßigen Mischung;

(b) gegebenenfalls Zugabe eines Füllstoffs und/oder Färbemittels bis zur Bildung einer gleichmäßigen Mischung;

(c) Zumischen eines künstlichen intensiven Süßungsmittels bis zur Bildung einer gleichmäßigen Mischung;

(d) Langsames Zumischen eines Aromaöls, aus welchem einige oder sämtliche der zunächst vorhandenen Terpenkomponenten entfernt wurden;

(e) Mischen bis zum Erhalt einer homogenen Masse und

(f) Kühlen des erhaltenen Gemisches zur Bildung eines Kaugummis und Gewinns des Produkts.

15. Verfahren nach Anspruch 14, wobei die weiche PVA-Kaugummigrundlage in einer Menge von 50 bis 90 Gew.-% der Kaugummimasse und das künstliche intensive Süßungsmittel in einer Menge von 0,01 bis 3,00 Gew.-% der Masse vorhanden sind.

16. Verfahren nach Anspruch 14 oder 15, durchgeführt zur Herstellung einer Kaugummimasse nach einem der Ansprüche 2 bis 13.

#### Patentansprüche für folgenden Vertragsstaat : ES

1. Verfahren zur Herstellung einer kalorienarmen und einen hohen Grundlagengehalt aufweisenden Kaugummimasse verbesserter Aromaintensität und anhaltenderem Aroma durch Vermischen

(a) einer Gummigrundlage in einer Menge von 50 bis 90 Gew.-% der Masse;

(b) eines Aromaöls, aus dem einige oder sämtliche der ursprünglich vorhandenen Terpenkomponenten entfernt wurden, in einer Menge von 0,3 bis 3,0 Gew.-% der Masse;

(c) eines intensiven Süßungsmittels in einer Menge von 0,01 bis 3,0 Gew.-% der Masse und

(d) eines Masse liefernden Mittels in einer Menge von 10 bis 40 Gew.-% der Masse.

2. Verfahren nach Anspruch 1, wobei die Gummigrundlage Polyvinylacetat (PVA) und ein natürliches oder synthetisches Elastomer, ausgewählt aus Chicle, Jelutong, Gutta percha, Kronengummi, Isobutyl-Isopren-Copolymer, Styrol/Butadien-Copolymer, Polyethylen, Polyisobutyl- und Mischungen derselben, umfaßt.

3. Verfahren nach Anspruch 1 oder 2, wobei die Gummigrundlage in einer Menge von 50 bis 70 Gew.-% der Masse vorhanden ist.

4. Verfahren nach Anspruch 1, 2 oder 3, wobei das Aromaöl aus einem Minzeöl besteht.

5. Verfahren nach Anspruch 4, wobei die Terpene aus dem Minzeöl durch Extraktion oder Fraktionieren entfernt wurden.

6. Verfahren nach Anspruch 5, wobei die Terpene, die entfernt wurden, aus Monoterpenen und/oder Sesquiterpenen bestehen.

7. Verfahren nach Anspruch 4, 5 oder 6, wobei das Minzeöl aus Pfefferminze, grüner Minze, Ackermintze und Mischungen hiervon ausgewählt ist.

8. Verfahren nach einem der vorhergehenden Ansprüche, wobei das Aromaöl in einer Menge von 0,1 bis 4,0 Gew.-% der Masse vorhanden ist.
9. Verfahren nach einem der vorhergehenden Ansprüche, wobei das Masse liefernde Mittel aus Xylose, Ribose, Glucose, Mannose, Galactose, Fructose, Dextrose, Polydextrose, Cellulose, Saccharose, Maltose, teilweise hydrolysierter Stärke oder Maissirupfeststoffen, Palatinit, Sorbit, Xylit, Mannit, Maltit und Mischungen derselben ausgewählt ist.
10. Verfahren nach einem der vorhergehenden Ansprüche, wobei das Masse liefernde Mittel in einer Menge von 10 bis 25 Gew.-% der Masse vorhanden ist.
11. Verfahren nach einem der vorhergehenden Ansprüche, wobei das intensive Süßungsmittel aus Natrium- oder Calciumsaccharinsalzen, Saccharin in freier Säureform, Cyclamatsalzen, Chlorsaccharosesalzen, Dipeptidverbindungen, Acesulfam-K und Mischungen derselben ausgewählt ist.
12. Verfahren nach Anspruch 11, wobei die Dipeptidverbindung aus L-Aspartyl-L-phenylalaninmethylester besteht.
13. Verfahren nach einem der vorhergehenden Ansprüche, wobei das intensive Süßungsmittel in einer Menge von 0,01 bis 0,60 Gew.-% der Masse vorhanden ist.
14. Verfahren zur Herstellung einer kalorienarmen und einen hohen Grundlagengehalt aufweisenden Kaugummimasse nach einem der vorhergehenden Ansprüche mit verbesserter Aromaintensität und anhaltenderem Aroma, durch:
  - (a) Vermischen einer aufgeschmolzenen weichen Kaugummigrundlage auf PVA-Basis mit einem Masse liefernden Mittel bis zur Bildung einer gleichmäßigen Mischung;
  - (b) gegebenenfalls Zugabe eines Füllstoffs und/oder Färbemittels bis zur Bildung einer gleichmäßigen Mischung;
  - (c) Zumischen eines künstlichen intensiven Süßungsmittels bis zur Bildung einer gleichmäßigen Mischung;
  - (d) Langsames Zumischen eines Aromaöls, aus welchem einige oder sämtliche der zunächst vorhandenen Terpenkomponenten entfernt wurden;
  - (e) Mischen bis zum Erhalt einer homogenen Masse und
  - (f) Kühlen des erhaltenen Gemisches zur Bildung eines Kaugummis und Gewinns des Produkts.
15. Verfahren nach Anspruch 14, wobei die weiche PVA-Kaugummigrundlage in einer Menge von 50 bis 90 Gew.-% der Kaugummimasse und das künstliche intensive Süßungsmittel in einer Menge von 0,01 bis 3,00 Gew.-% der Masse vorhanden sind.

#### 40 Revendications

Revendications pour les Etats contractants suivants : BE, DK, FR, DE, GR, IT, NL, SE, CH, GB

1. Une composition de gomme à mâcher à teneur élevée en base et à faible teneur en calories dont la durée et l'intensité de l'arôme sont améliorées, comprenant:
  - a) une base de gomme en une quantité de 50 à 90% en poids de la composition;
  - b) une huile aromatisante dont une partie ou la totalité des terpènes originellement présents ont été éliminés et qui est présente en une quantité de 0,3 à 3,0% en poids par rapport au poids de la composition;
  - c) un édulcorant intense en une quantité de 0,01 à 3,0% en poids par rapport au poids de la composition; et
  - d) un agent de charge en une quantité de 10 à 40% en poids par rapport au poids de la composition.
2. Une composition selon la revendication 1 dans laquelle la base de gomme comprend de l'acétate de polyvinyle (PVA) et un élastomère naturel ou synthétique sélectionné parmi chicle, jelutong, gutta percha, gomme couronne, copolymère isobutylène-isoprène, copolymère styrène-butadiène, polyéthylène, polyisobutylène et leurs mélanges.

3. Une composition selon la revendication 1 ou 2 dans laquelle la base de gomme est présente en une quantité de 50 à 70% en poids par rapport au poids de la composition.
- 5 4. Une composition selon la revendication 1, 2 ou 3, dans laquelle l'huile aromatisante est une essence de menthe.
5. Une composition selon la revendication 4, dans laquelle les terpènes ont été éliminés de l'essence de menthe par extraction ou fractionnement.
- 10 6. Une composition selon la revendication 5, caractérisée en ce que les terpènes qui ont été éliminés sont des monoterpènes et/ou des sesquiterpènes.
7. Une composition selon la revendication 4, 5 ou 6 dans laquelle l'essence de menthe est sélectionnée parmi menthe poivrée, menthe verte, menthe de maïs et leurs mélanges.
- 15 8. Une composition selon l'une quelconque des revendications précédentes dans laquelle l'huile aromatisante est présente en une quantité de 0,1 à 4,0% en poids par rapport au poids de la composition.
9. Une composition selon l'une quelconque des revendications précédentes dans laquelle l'agent de charge est sélectionné parmi xylose, ribose, glucose, mannose, galactose, fructose, dextrose, polydextrose, cellulose, saccharose, maltose, solide de sirop de maïs ou amidon partiellement hydrolysé, palatinite, sorbitol, xylitol, mannitol, maltitol et leurs mélanges.
- 20 10. Une composition selon l'une quelconque des revendications précédentes dans laquelle l'agent de charge est présent dans une quantité de 10 à 25% en poids par rapport au poids de la composition.
- 25 11. Une composition selon l'une quelconque des revendications précédentes dans laquelle l'édulcorant intense est sélectionné parmi les, sels sodiques ou calciques de saccharine, la forme acide libre de la saccharine, sels de cyclamate, dérivés de chlorosaccharose, composés dipéptidiques, acesulfame-K et leurs mélanges.
- 30 12. Une composition selon la revendication 11 dans laquelle le composé dipeptidique est le méthyl ester de L-aspartyl-L-phenylalanine.
- 35 13. Une composition selon l'une quelconques des revendications précédentes dans laquelle l'édulcorant intense est présent en une quantité de 0,01 à 0,60% du poids par rapport au poids de la composition.
- 40 14. Un procédé de préparation d'une composition de gomme à mâcher à basse teneur en calories et à forte teneur en base selon la revendication 1, dont la durée et l'intensité de l'arôme sont améliorés, le procédé comprenant:
  - a) le mélange d'une gomme à mâcher à base de PVA mou fondu avec un agent édulcorant de charge jusqu'à la formation d'un mélange uniforme;
  - b) le mélange éventuellement d'une charge et/ou d'un colorant jusqu'à la formation d'un mélange uniforme;
  - 45 c) le mélange d'un agent édulcorant intense artificiel jusqu'à la formation d'un mélange uniforme;
  - d) le mélange lent d'une huile aromatisante dont une partie ou la totalité des composants terpéniques originellement présents ont été éliminés;
  - e) mélange jusqu'à la formation d'une masse homogène;
  - f) refroidissement du mélange résultant pour former une gomme à mâcher et récupération du produit.
- 50 15. Un procédé selon la revendication 14, dans lequel la base de gomme à mâcher constituée de PVA mou est présente en une quantité de 50 à 90% en poids par rapport au poids de la composition de gomme à mâcher et l'édulcorant intense artificiel est présent dans une quantité de 0,01 à 3,00% en poids par rapport au poids de la composition.
- 55 16. Un procédé selon la revendication 14 ou 15, mis en oeuvre pour produire une composition de gomme à mâcher selon l'une quelconque des revendications 2 à 13.

**Revendications pour l'Etat contractant suivant : ES**

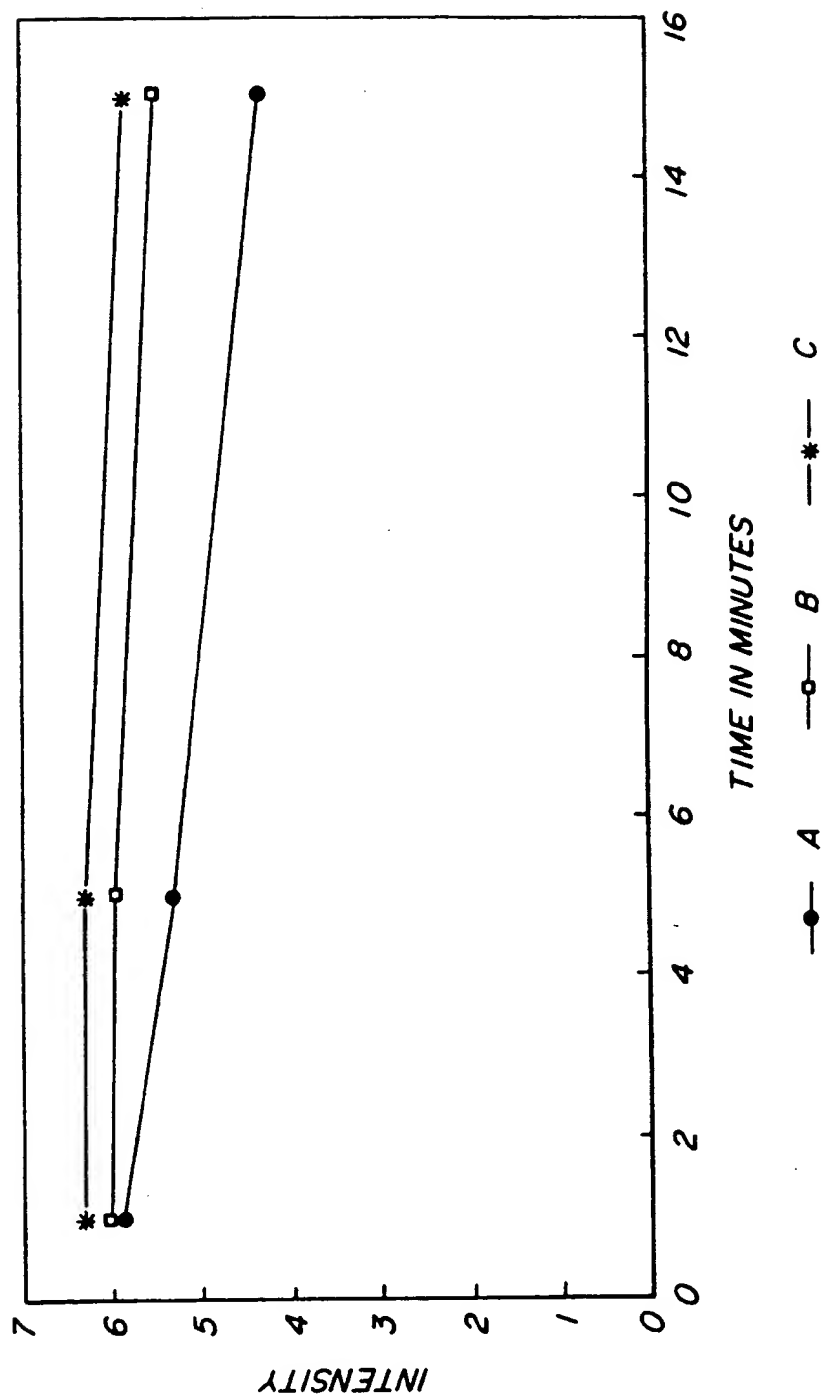
1. Un procédé de préparation d'une composition de gomme à mâcher à teneur réduite en calories et à teneur élevée en base dont la durée et l'intensité de l'arôme sont améliorés, lequel procédé comprend le mélange de:
  - a) une base de gomme en une quantité de 50 à 90% en poids de la composition;
  - b) une huile aromatisante dont une partie ou la totalité des terpènes originellement présents ont été éliminés et qui est présente en une quantité de 0,3 à 3,0% en poids par rapport au poids de la composition;
  - c) un édulcorant intense en une quantité de 0,01 à 3,0% en poids par rapport au poids de la composition; et
  - d) un agent de charge en une quantité de 10 à 40% en poids par rapport au poids de la composition.
2. Un procédé selon la revendication 1, caractérisé en ce que la base de gomme comprend de l'acétate de polyvinyle (PVA) et un élastomère naturel ou synthétique sélectionnés parmi chicle, jelutong, gutta percha, gomme couronne, copolymère isobutylène-isoprène, copolymère styrène-butadiène, polyéthylène, polyisobutylène et leurs mélanges.
3. Un procédé selon la revendication 1 ou 2 dans lequel la base de gomme est présente en une quantité de 50 à 70% en poids par rapport au poids de la composition.
4. Un procédé selon la revendication 1, 2 ou 3 dans lequel l'huile aromatisante est une essence de menthe.
5. Un procédé selon la revendication 4, caractérisé en ce que les terpènes ont été éliminés de l'essence de menthe par extraction ou fractionnement.
6. Un procédé selon la revendication 5 dans lequel les terpènes qui ont été éliminés sont des monoterpènes et/ou des sesquiterpènes.
7. Un procédé selon la revendication 4, 5 ou 6 dans lequel l'essence de menthe est sélectionnée parmi menthe poivrée, menthe verte, menthe de maïs et leurs mélanges.
8. Un procédé selon l'une quelconque des revendications précédentes dans lequel l'huile aromatisante est présente en une quantité de 0,1 à 4,0 % en poids par rapport au poids de la composition.
9. Un procédé selon l'une quelconque des revendications précédentes dans lequel l'agent de charge est sélectionné parmi xylose, ribose, glucose, mannose, galactose, fructose, dextrose, polydextrose, cellulose, saccharose, maltose, solide de sirop de maïs ou amidon partiellement hydrolysé, palatinité, sorbitol, xylitol, mannitol, maltitol et leurs mélanges.
10. Un procédé selon l'une quelconque des revendications précédentes dans lequel l'agent de charge est présent en une quantité de 10 à 25% en poids par rapport au poids de la composition.
11. Un procédé selon l'une quelconque des revendications précédentes dans lequel l'édulcorant intense est sélectionné parmi les sels sodiques ou calciques de saccharine, la forme acide libre de la saccharine, sels de cyclamate, dérivés de chlorosaccharose, composés dipeptidiques, acesulfame-K et leurs mélanges.
12. Un procédé selon la revendication 11 dans lequel le composé dipeptidique correspond au méthyl ester de L-aspartyl-L-phénylalanine.
13. Un procédé selon l'une quelconque des revendications précédentes dans lequel l'édulcorant intense est présent dans une quantité de 0,01 à 0,60% en poids par rapport au poids de la composition.
14. Un procédé selon l'une quelconque des revendications précédentes de préparation d'une composition de gomme à mâcher à basse teneur en calories et à forte teneur en base, dont la durée et l'intensité

de l'arôme sont améliorés, le procédé comprenant:

- a) le mélange d'une gomme à mâcher à base de PVA mou fondu avec un agent édulcorant de charge jusqu'à la formation d'un mélange uniforme;
- b) le mélange éventuellement d'une charge et/ou d'un colorant jusqu'à la formation d'un mélange uniforme;
- c) le mélange d'un agent édulcorant intense artificiel jusqu'à la formation d'un mélange uniforme;
- d) le mélange lent d'une huile aromatisante dont une partie ou la totalité des composants terpéniques originellement présents ont été éliminés;
- e) mélange jusqu'à la formation d'une masse homogène;
- f) refroidissement du mélange résultant pour former une gomme à mâcher et récupération du produit.

15. Un procédé selon la revendication 14, dans lequel la base de gomme à mâcher constituée de PVA mou est présente en une quantité de 50 à 90% en poids par rapport au poids de la composition de gomme à mâcher et l'édulcorant intense artificiel est présent dans une quantité de 0,01 à 3,00% en poids par rapport au poids de la composition.



**FIG-1** FLAVOR RELEASE PEPPERMINT OILS

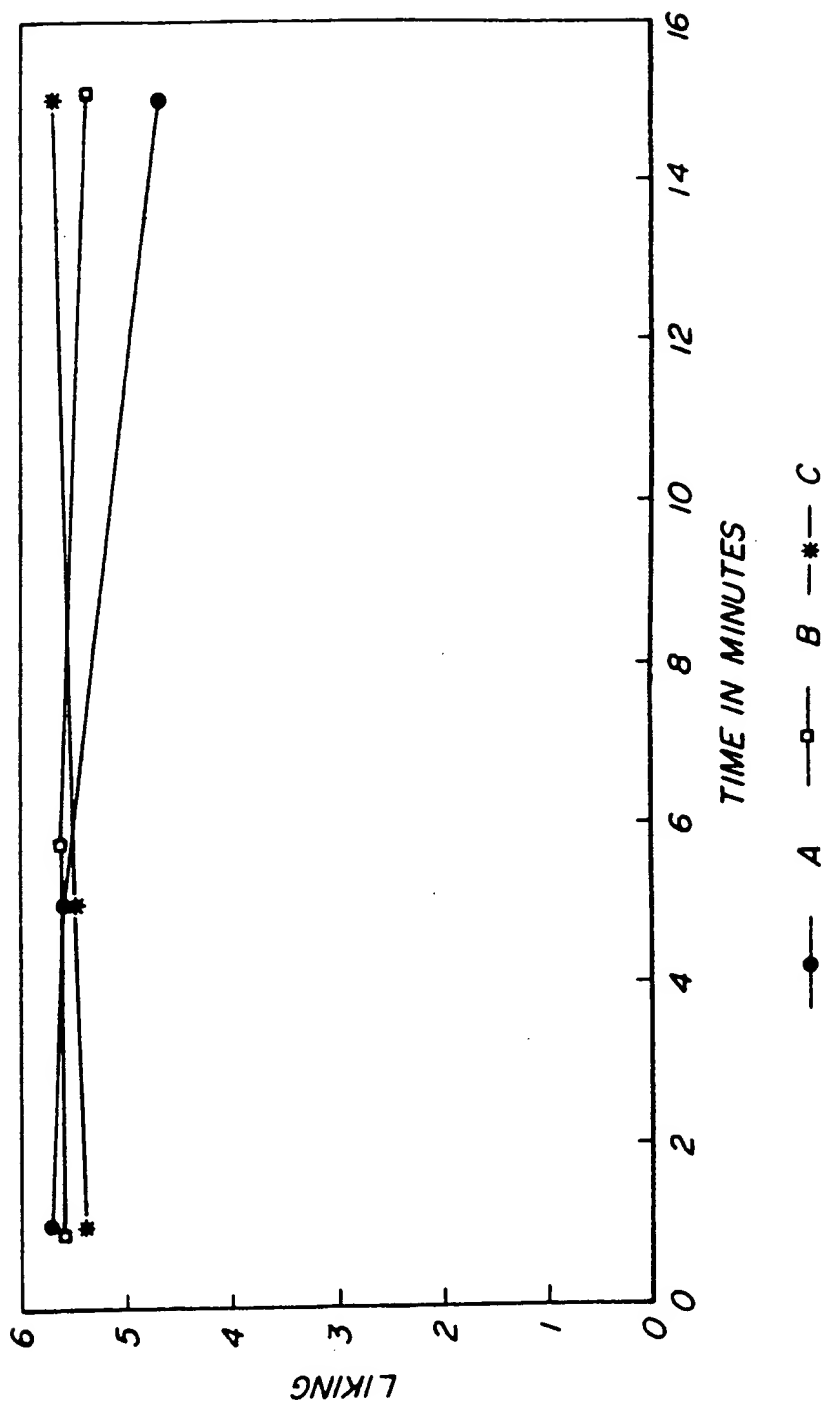
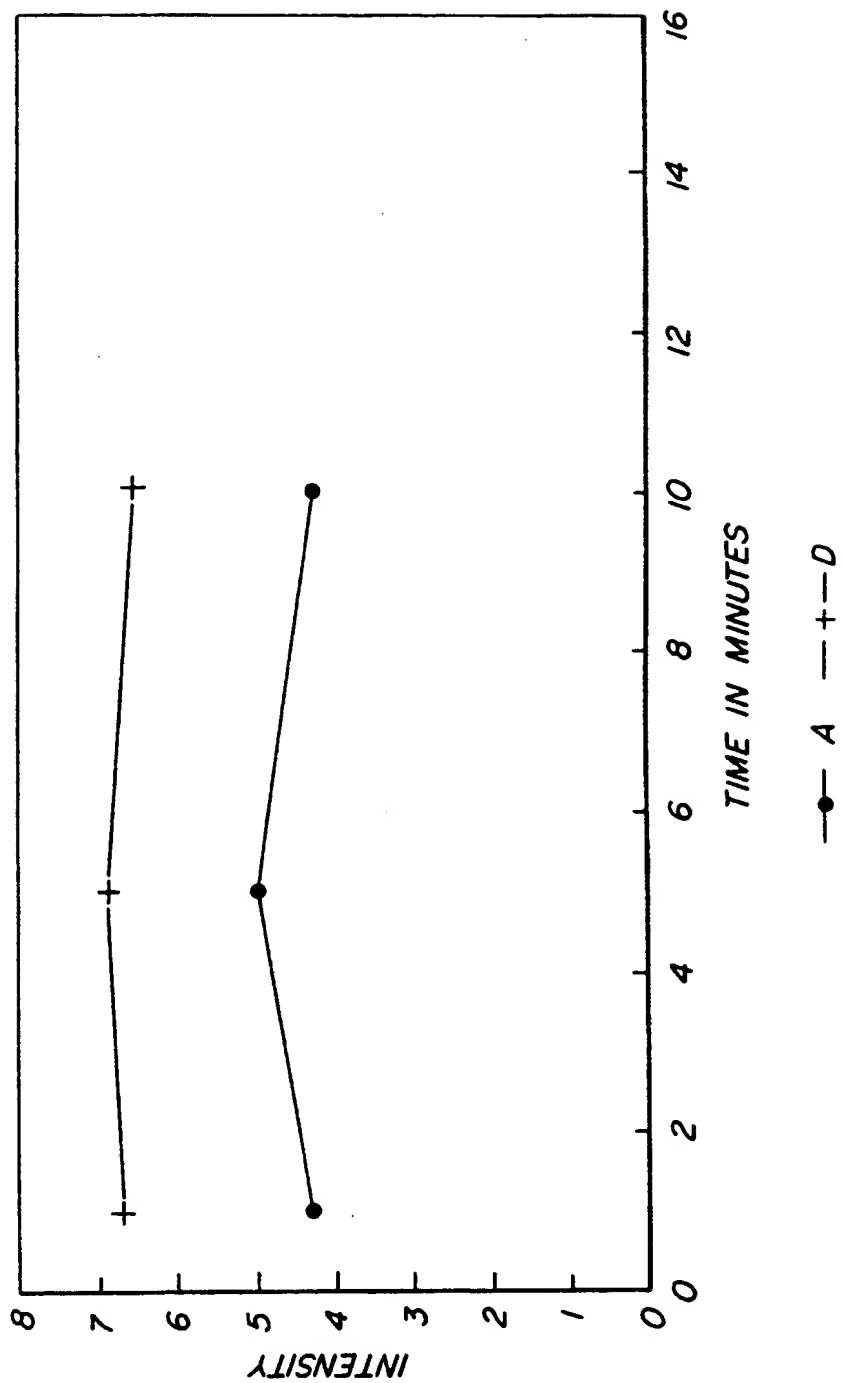
**FIG-2** FLAVOR RELEASE PEPPERMINT OILS

FIG-3 FLAVOR RELEASE PEPPERMINT OILS



**FIG-4** FLAVOR RELEASE PEPPERMINT OILS

